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TO: The House Regulatory Reform Committee;
Representative Crawford, Chairman

FROM: Melody Eide, MD on behalf of the Michigan Dermatological Society

RE: Support and Testimony for House Bill 4405.

Thank you Mister Chairman, and distinguished members of the Committee on Regulatory Reform for the opportunity to provide testimony in support of HB 4405. My name is Melody J. Eide, MD MPH FAAD and I am a board-certified dermatologist as well as a public health scientist at the Henry Ford Health System in Detroit and Troy, MI, and have spent more than a decade researching skin cancer.

Today's discussion on HB 4405 to prohibit minors from indoor tanning is very timely as skin cancer is increasing at epidemic proportions.

Public Health and Skin Cancer
Skin cancer is the most common of all cancers in the United States, and the treatment of new skin cancers is estimated at more than $2.4 billion annually. There will be more than two million cases diagnosed this year, with a burden so high that our national Surveillance Epidemiology and End Results (SEER) registry program does not even track all skin cancers. In 2013, SEER estimates that 76, 690 Americans will be diagnosed with melanoma, which is responsible for about 73% of skin cancer deaths, killing one person every 50 minutes. Melanoma is the second most common cancer among those under age 30, and second only to breast cancer in women under age 39.

Incidence rates of both melanoma and non-melanoma skin cancer have sky-rocketed over the past decades, especially in young women. More young women, compared to young men, have been developing skin cancer since the 1990s, with increases greatest for advanced cancer and on the trunk—an area of the body that is not likely to be exposed in day-to-day activities. This increase parallels trends in indoor tanning use in the United States which has increased from one-percent of American adults reported using indoor tanning facilities in 1988 to 27% by 2007.

Despite what opponents of this legislation may say, the scientific evidence from more than 30 global studies and multiple meta-analyses show a clear and undeniable relationship between UV radiation from tanning beds and the development of skin cancer. The science is unquestionable: Use of indoor tanning beds increases your risk of developing skin cancer.

Ultraviolet Radiation Overview
Traditionally, solar radiation has been the main source of human exposure to ultraviolet (UV) radiation, which is subdivided into UVA (400-320 nm), UVB (320-290 nm), and UVC (290-100) (visible light is 400-700 nm). Solar radiation as a risk factor for skin cancer is well established, and solar radiation is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC), a World Health Organization (WHO) agency which classifies carcinogens.

UVB was originally considered the only carcinogenic part of the solar spectrum, through the generation of DNA damage by cyclobutane pyrimidine dimers (CPDs) that cause C->T and CC->TT mutations, also known as UVB fingerprint mutations. Ultraviolet B induces more inflammation and is associated with sunburns. However, this was an inaccurate presumption.

Ultraviolet A (320-400 nm) also induces DNA damage by cyclobutane pyrimidine dimers, and may be 1000 to 10, 000 times more effective for inducing skin cancer than UVB. UVA alone may induce greater cumulative changes that full spectrum solar-simulated radiation (290-400) from the sun. UVA induced photo damage includes increases in response erythema, epidermal hyperplasia, Langerhans cell depletion, dermal inflammation and lysozyme deposition on elastin fibers. Cumulative damage does not parallel spectrum for acute injury (damage in absence of injury). Tanning beds primarily emit these dangerous UVA rays (>90%).

The tumor suppressor gene, p53, which is important for DNA repair, cell cycle arrest and apoptosis (death) of damaged skin cells, can be UV-mutated. Chronic UVA exposures can induce malignant transformation due to acquired apoptotic resistance (damaged cell longevity rather than cell death). Ultraviolet activation of p53 induces transcription of a host of target genes, including the pro-opiomelanocortin (POMC) Pro-opiomelanocortin is related to A-Melanocyte stimulating hormone (a-MSH) which increases melanogenesis, melanocyte differentiation & melanosome transfer (tanning). β-endorphin, another POMC derivative, contributes to the addictive potential of tanning through opioid receptors and is released following UV irradiation.

Ultraviolet radiation is powerful. Damage to the skin happens *even* in the absence of a tan, and no amount of UV exposure is safe. There is no such thing as a "safe tan" and by definition, a tan is evidence of skin damage. I counsel my patients to wear sunscreen daily, year round and to avoid intentional UV exposure, both indoor and outdoor. Unfortunately, national rates of indoor tanning suggest that 27% of 17 year old girls use indoor tanning, and those 17 and under are also less likely to be aware of warning labels on tanning beds than adults.

Indoor tanning and Ultraviolet Radiation
First introduced in the 1970s, indoor tanning booths have emerged as a major source of avoidable UV radiation. Since the 1980s, most indoor tanning equipment emits mainly UVA, with less than 5% in the UVB range, though the US Food and Drug Administration (FDA) does not regulate the relative amounts of UVA and UVB in tanning devices. Recently the FDA has proposed changes to its regulation of tanning beds, including a strong recommendation against the use of tanning beds by minors.
Multiple studies have shown concerning evidence that tanning bed patrons are receiving higher doses of UV radiation than they would from environmental summer sun exposure. Studies have suggested that tanning beds may radiate as much as 15 times more UVA and 2 times more UVB than from summer sun with equal exposure. The mean erythema dose (MED) threshold

(time to redness of the skin on exposure to UV) for Caucasians with a skin type II (Caucasian skin that tans) is less than 13 minutes. The World Health Organization's International Agency for Research on Cancer has placed tanning beds in the highest risk carcinogen category, alongside other Group I carcinogens including asbestos, cigarettes, and arsenic since 2009.

Vitamin D and Ultraviolet exposure

The effect of vitamin D on health has gained significant global interest over the last several years. The U.S. Institute of Medicine (IOM) vitamin D in their review of the scientific evidence, concluded that vitamin D is important in bone health with inconsistent, inconclusive evidence of benefits for other health concerns. The topic of vitamin D and health is often raised when discussing ultraviolet radiation.

There are three main sources for vitamin D: our diet (e.g. fortified dairy, oily fish, eggs), oral vitamin supplementation (including many multivitamins) and the cutaneous synthesis of vitamin D in the skin. The latter is the most controversial. In cutaneous vitamin D synthesis, UVB rays cause the conversion of 7-dehydrocholesterol to pre-Vitamin D3, which in the bloodstream becomes vitamin D3. Vitamin D3 is then hydroxylated in the liver to 25-hydroxyvitamin D and then travels to the kidney where becomes active form of 1,25 hydroxyvitamin D. Darker skin types photosynthesize less 25-OHD because of UV absorption by melanin.

Tanning beds emit primarily UVA (320-400 nm) radiation as mentioned earlier. The action spectrum for vitamin D synthesis is predominantly in the UVB range, peaking at around 300 nm. Because most indoor tanning devices emit only 1-2% UVB, they are not recommended as a source of vitamin D. A recent randomized controlled trial found that tanning bed users' serum 25-hydroxyvitamin D3 levels increased slightly and plateau after only four sunbed sessions of six minutes.

Public Health and Indoor tanning

The relationship of indoor tanning with public health is not favorable. Indoor tanning is addictive through opoid receptor activation and its UVA dominated spectrum and DNA damage induction do not support its use for vitamin D acquisition. Indoor tanning is a recognized carcinogen and increases in skin cancer in young adults parallel indoor tanning growth. A WHO metanalyses of more than 25 studies shows undeniable evidence of risk: Indoor tanning bed use before age 35 increases the risk of melanoma by at least 75%. More than 30 states have adopted legislation to require parental permission for minors to use indoor tanning. However this legislation has not been found to significantly reduce use by teens. While indoor tanning is dangerous for people regardless of age, further legislation targeting teen tanning is imperative and a ban on teen indoor tanning is supported by the World Health Organization and Michigan dermatologists.

Our teens are being preyed on. Print and online advertisements target teenage girls, with prom and homecoming packages and student specials. Last year, the US Energy and Commerce Committee released an investigative report detailing the false and misleading health information provided to teens by the indoor tanning industry. The report had five main findings:

1. 90 percent of tanning salons denied the known risks of indoor tanning. Salons described the suggestion of a link between indoor tanning and skin cancer as a myth, a rumor or hype.

Four out of five salons falsely claimed that indoor tanning is beneficial to a young person's health.

1. Salons used many approaches to downplay the health risks of indoor tanning, including blaming the use of sunscreen as the reason for rising rates of skin cancer in the US.
2. Tanning salons fail to follow the US Food and Drug Administration's recommendations on tanning frequency of no more than three visits in the first week and a minimum of 24 hours between tanning sessions.
3. Tanning salons target teenage girls in their print and online advertisements.

Strong laws are needed to provide oversight of this industry and protect our state's youth.

Regulation of carcinogenic or dangerous products is not new. Governmental leaders direct health policy and enact laws in the interest of educating the public and trying to preserve the health and wellbeing of its citizens. This is especially important for vulnerable groups such as minors who are easily influenced. Our Government restricts minors' use of tobacco for this reason. We do not have parental consent permission for the use of cigarettes for teenagers. Indoor tanning is also an addictive class I carcinogen: why do we make an exception for ultraviolet radiation exposure from indoor tanning? We as physicians and public health scientists can only educate the public so much. Our message and recommendations cannot be heard without your help.

On behalf of the American Academy of Dermatology Association and Michigan Dermatological Society, I urge you to pass HB 4405.